

Peter Hoor (JGU), Vera Bense (JGU), Aurelia Müller (JGU), Heiko Bozem (JGU), Hans-Christoph Lachnitt (JGU), Birte Hülsen (GUF)

## Coordination of the CRC

### Foster collaboration within TPChange and beyond

- >32 meetings and workshops, partially with the international scientific community, e.g. **Mathematics of Weather (MOW)** conference
- >20 invited international experts to colloquia and meetings
- **International TPChallenges conference** at JGU Mainz with >120 participants
- **Central organs:** speaker, coordination, scientific steering group, PhD representatives, general assembly of all members



Figure 1: International TPChallenges conference in Mainz (11 - 14 March 2024)

### Equal opportunities

#### >20 measures:

- career support for female ECR through **workshops** and meeting **role models**
- enabling **family compatibility** for young parents: home office, childcare
- sensibilisation workshops for all PI: diverse teams, recruitment

### Science communication

- >100 publications, most of which OA, Special Issue
- Outreach events during campaigns BISTUM I+II and TPEX I for locals
- >20 public presentations: museums, schools, GUF night of science
- Projects by ECR: Workshop at **LCOY** (youth climate conference) and **video project** with first-year students in environmental sciences

### Support for Early Career Researchers

#### >20 meetings and events:

- **Collaboration** and **networking** meetings within ECR group and with invited senior scientists outside of TPChange
- **Lecture series, workshops** on scientific writing, presentations, usage of specific software, career orientation, data management
- **PhD support groups** (regular meetings, reports)

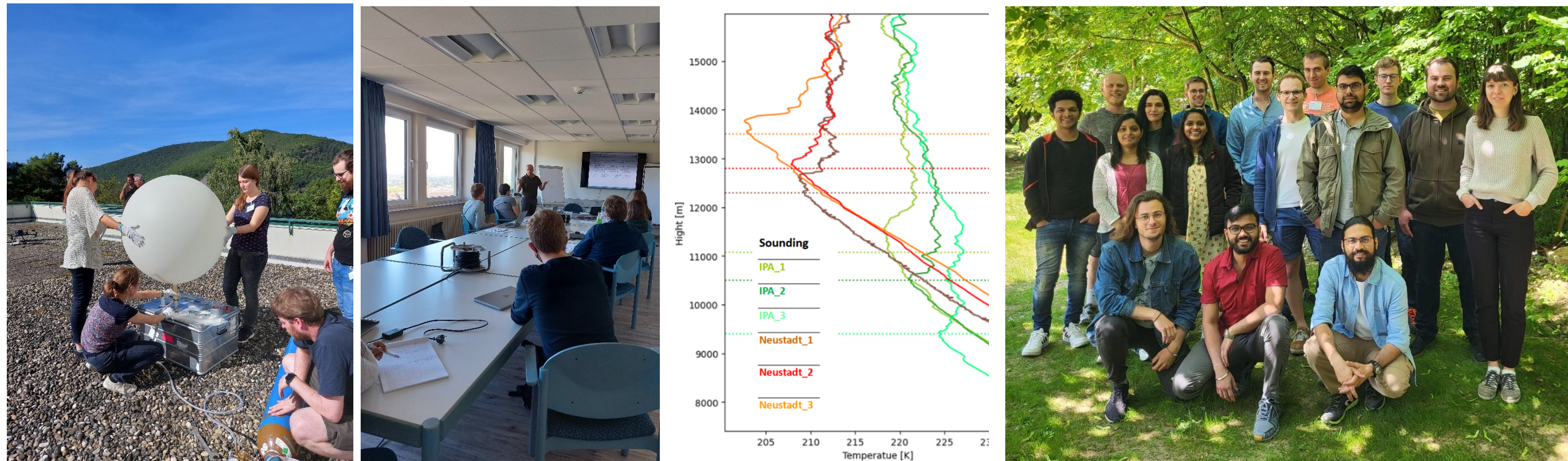


Figure 2: Project work during summer school in Neustadt an der Weinstraße (11 - 16 September 2022) and group picture of ECR meeting in Würzburg (23 - 25 May 2023)

## Observational data synthesis

### TPEX I: Tropopause composition gradients and mixing Experiment



Figure 3: The TPEX I team in front of the Learjet aircraft.

#### Publications:

Bozem et al. 2025, Breuninger et al. 2025, Emig et al. 2025, Joppe et al. 2025, Konjari et al. 2025

- **Campaign preparation:**
  - **Chair regular meetings** with PIs and external partners to coordinate instrument developments
  - **Support** development and implementation of forecast tools and meteorological data for flight planning
- **Certification: support and management** of certification process for scientific payload
- **Campaign: coordination** of flight planning with pilots to address research questions
- **Post campaign: guidance** of data evaluation process in accordance to data policy

### BISTUM I+II: Bridging Surface emissions, Transport and UTLS Matters

- Numerous balloon and drone flights from Tailfingen and Spielberg
- Coordinated measurements with Learjet during TPEX I
- **Proof of concept successful**
- Publications: [Moormann et al. 2025](#)  
[Jost et al. 2025](#)



Figure 4: Setup balloon sounding

### Joint campaign database

- Interpolations performed for **51 measurement campaigns** (1997 – 2024)
  - 4957 flights and soundings and 15890 flight hours
  - > 5.7 million data points on 26 different measurement platforms
- Data used by **20 individuals** and groups in- and outside of TPChange
- Homogenized procedure to process balloon and airplane measurements
- Data **published** and **downloadable:** <https://doi.org/10.5281/zenodo.15076520>

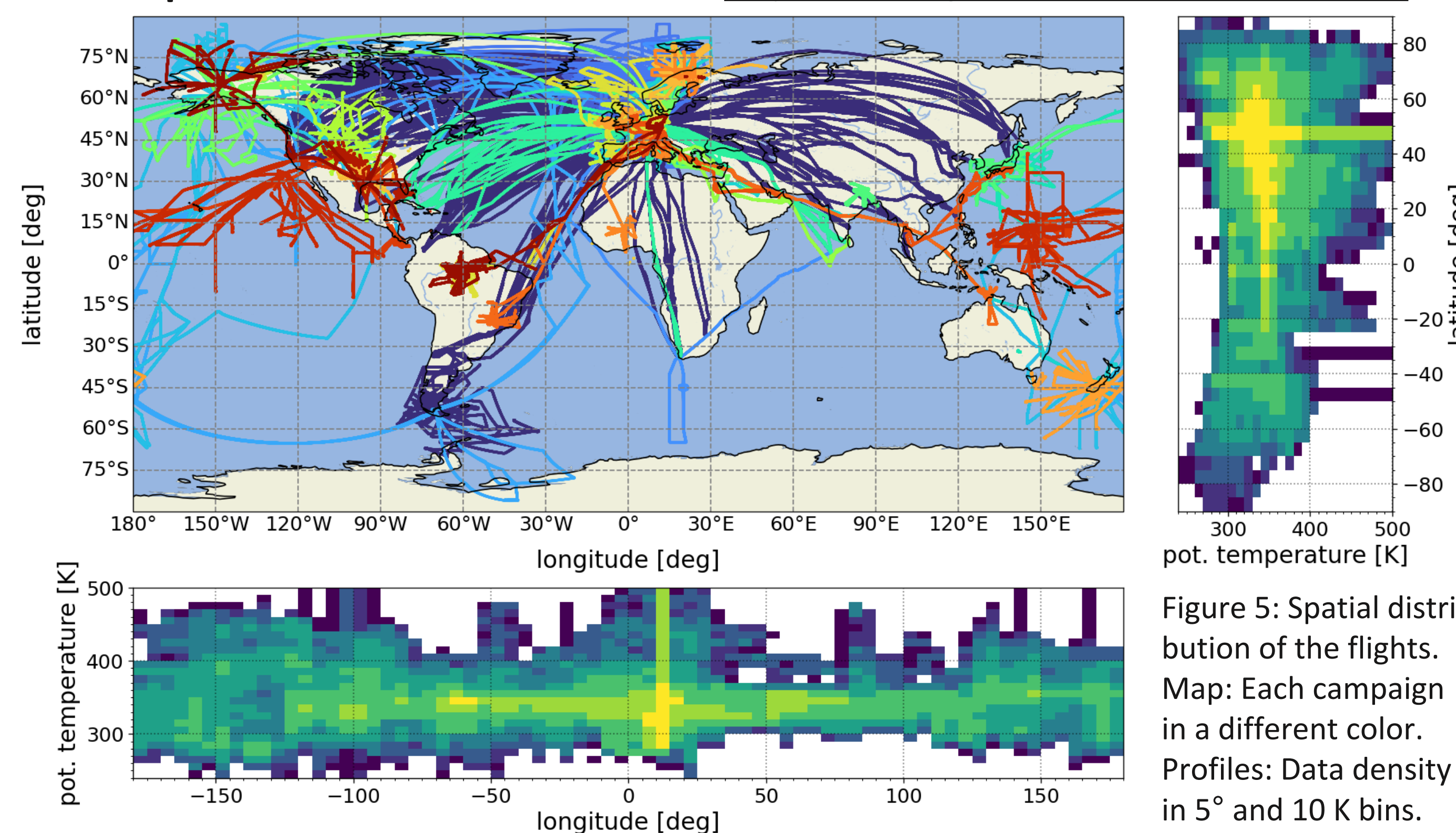


Figure 5: Spatial distribution of the flights. Map: Each campaign in a different color. Profiles: Data density in 5° and 10 K bins.

## Phase II

**Main goal: Provide environment and infrastructure for excellent working conditions and successful scientific collaborations**

### Coordination

- Continue measures that **have proven successful**
  - ECR workshop programme (collaboration with trainers, senior scientists)
- Strengthen **ECR self-organisation**
  - One ECR representative per institution
  - **Allocated budget**, to be distributed in regular ECR meetings (bi-annually)
- Increase **visibility** of TPChange
  - Continue public talks at museums, schools
  - Coordinated collaboration with Mainzer Wissenschaftsallianz “Science Schoppe”

### TPEX II

- **Continue** the successful TPEX I mission
- Planned for **spring 2027**
- Main goal: investigation of **baroclinic wave activity** and **fine scale structure** of the tropopause
- Instrumentation:
  - **TPC-TOSS** and **Learjet** aircraft
  - same experimental configuration as TPEX I
  - 11 research projects involved: A02, A03, A04, A05, A06, B01, B02, B07, B08, C01, C08



Figure 6: Measurement platforms for TPEX II – Learjet and TPC-TOSS

### Wind tunnel laboratory

- **Operation of experiments** for A05 and A06 by an **experienced scientist**
- Test of new **instrumental developments**
- **Laboratory characterisation** of instruments for TPEX II campaign
- **Laboratory studies** to complement TPEX II campaign data analysis

### Joint campaign database

- **Homogenised data** allows for cross-platform analyses to be carried out more easily (from the process scale to longer time periods) and a more coherent model evaluation in the future
- Adding **further and future campaigns** and **additional model data**
- Close collaboration with Z02 to ensure the database fulfills the **FAIR** principles and guarantees **open access** (e.g. on Zenodo)